

## CLAIMS

1. A system for printing images on a substrate, comprising:

a) an ink-jet ink including:

- 5           i)       a liquid vehicle including water, and from 5 wt% to 35 wt%  
              total organic solvent content,  
              ii)       from 0.1 wt% to 6 wt% of acid-functionalized pigment  
                      solids;  
              iii)       from 0.001 wt% 6 wt% of styrene-maleic anhydride  
10           copolymer, said styrene-maleic anhydride copolymer  
              having a weight average molecular weight from about 400  
              Mw to 15,000 Mw.

b) a printhead loaded with the ink-jet ink.

15           2. The system of claim 1, wherein the acid-functionalized pigment solids  
have an average size from about 5 nm to about 10  $\mu$ m.

              3. The system of claim 1, wherein the ink-jet ink further comprises from  
0.001 wt% to 0.3 wt% surfactant.

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              4. The system of claim 1, wherein the ink-jet ink further comprises from  
0.05 wt% to 4 wt% of a salt selected from the group consisting of ammonium  
salt, sodium salt, potassium salt, and lithium salt.

25           5. The system of claim 4, wherein the ammonium salt is ammonium  
benzoate.

              6. The system of claim 1, wherein an acid precursor used to form the  
acid-functionalized pigment is selected from the group consisting of para-  
30   aminobenzoic acids, isophthalic acids, triacids, and combinations thereof.

7. The system of claim 1, wherein the printhead is configured for jetting the ink-jet ink at a firing frequency from 12 kHz to 25 kHz.

8. The system of claim 1, wherein the printhead is configured for jetting the ink-jet in at a drop volume from about 10 pL to 20 pL.

9. The system of claim 1, wherein the ink-jet ink further comprises a TRIS buffer.

10. The system of claim 1, wherein the organic solvent content includes at least three of 1,5-pentanediol, ethoxylated glycerol, 1,2-pyrrolidinone, and 2-methyl-1,3-propanediol.

11. A method of rapidly printing an ink-jet image, comprising ink-jetting an ink-jet ink onto a media substrate at a firing frequency from 12 kHz to 25 kHz, said ink-jet ink comprising:

- a) a liquid vehicle including water, and from 5 wt% to 35 wt% total organic solvent content,
- b) from .01 wt% to 6 wt% of acid-functionalized pigment solids;
- c) from 0.001 wt% 6 wt% of styrene-maleic anhydride copolymer, said styrene-maleic anhydride copolymer having a weight average molecular weight from about 400 Mw to 15,000 Mw.

12. The method of claim 11, wherein the acid-functionalized pigment solids have an average size from about 5 nm to about 10  $\mu$ m.

13. The method of claim 11, wherein the ink-jet ink further comprises from 0.001 wt% to 0.3 wt% surfactant.

14. The method of claim 11, wherein the ink-jet ink further comprises from 0.05 wt% to 4 wt% of an ammonium salt.

15. The method of claim 14, wherein the ammonium salt is ammonium benzoate.

5 16. The method of claim 11, wherein an acid precursor used to form the acid-functionalized pigment is selected from the group consisting of para-aminobenzoic acids, isophthalic acids, triacids, and combinations thereof.

17. The method of claim 11, wherein the firing frequency is from 15 kHz to 25 kHz.

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18. The method of claim 11, wherein ink-jetting step is at a drop volume from about 10 pL to 20 pL.

19. The method of claim 11, wherein the ink-jet ink further includes a TRIS buffer.

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20. The method of claim 11, wherein the organic solvent content includes at least three of 1,5-pentanediol, ethoxylated glycerol, 1,2-pyrrolidinone, and 2-methyl-1,3-propanediol.

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21. An ink-jet ink composition, comprising:

- a) a liquid vehicle having from 5 wt% to 35 wt% of total organic solvent content;
- b) from 0.1 wt% to 6 wt% of acid-functionalized pigment solids;
- 25 c) from 0.001 wt% to 6 wt% of styrene-maleic anhydride copolymer, said styrene-maleic anhydride copolymer having a weight average molecular weight from about 400 Mw to 15,000 Mw.

22. The ink-jet ink composition of claim 21, wherein the acid-functionalized pigment solids have an average size from about 5 nm to about 10  $\mu\text{m}$ .

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23. The ink-jet ink composition of claim 21, wherein the ink-jet ink further comprises from 0.001 wt% to 0.3 wt% surfactant.

5 24. The ink-jet ink composition of claim 21, wherein the ink-jet ink further comprises from 0.05 wt% to 4 wt% of an ammonium salt.

25. The ink-jet ink composition of claim 24, wherein the ammonium salt is ammonium benzoate.

10 26. The ink-jet ink composition of claim 21, wherein an acid precursor used to form the acid-functionalized pigment is selected from the group consisting of para-aminobenzoic acids, isophthalic acids, triacids, and combinations thereof.

15 27. The ink-jet ink composition of claim 21, wherein the ink-jet ink composition is reliably jettable at a firing frequency from 12 kHz to 25 kHz.

28. The ink-jet ink composition of claim 21, wherein the ink-jet ink composition is reliably jettable at a drop volume from about 10 pL to 20 pL.  
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29. The ink-jet ink composition of claim 21, wherein the ink-jet ink further includes a TRIS buffer.

30. The method of claim 21, wherein the organic solvent content  
25 includes at least three of 1,2-pentanediol, ethoxylated glycerol 1, 2-pyrrolidinone, and 2-methyl-1,3-propanediol.